

CLAIMS

What is claimed is:

1. An RF telemetry antenna system for communications between an external programmer and an implantable medical device, said system comprising:

an implantable medical device housing, comprising a conductive, metal housing portion and a dielectric housing portion;

a self-resonating, monopole RF antenna contained within said dielectric portion of said medical device housing, said monopole antenna having a free end and a connection end; and

an internal transmitter/receiver circuit;

wherein the monopole RF antenna has an elongate form which is folded at least once and conformed inside the dielectric housing portion, and

wherein the connection end of the antenna is connected to the transmitter receiver circuit having a ground reference, which ground reference, in turn, is connected to the metal housing portion that acts as a ground plane.

2. The system of claim 1, wherein the monopole RF antenna is coupled to the transmitter/receiver circuit that is placed on an internal, printed circuit board.

3. The system of claim 1, wherein the dielectric housing portion is a biocompatible epoxy and the metal housing portion is titanium.

4. The system of claim 3, wherein the epoxy has a dielectric constant ϵ_r of about 3.6.

5. The system of claim 1, wherein the antenna elongate form is a conductive wire.
6. The system of claim 1, wherein the antenna is made from a conductive material from the group consisting of copper, platinum and gold.
7. The system of claim 6, wherein the antenna is formed from copper wire that is 20 AWG.
8. The system of claim 1, wherein the antenna elongate form is a conductive strip.
9. The system of claim 1, wherein the RF monopole antenna is folded within the dielectric housing portion to provide maximum separation between the folded monopole antenna and the metal housing portion.
10. The system of claim 9, wherein the folded monopole antenna is formed into a shape comprising a first arc and second arc,
wherein the first arc is in a first plane and the second arc is in a second plane, which planes are substantially parallel to each other.
11. The system of claim 1, wherein the RF monopole antenna is sized to provide an antenna self-resonance frequency of about 403.5 MHz.
12. The system of claim 1, wherein the dielectric housing portion is a portion of a substantially flat, elliptical cylinder.

13. An RF telemetry antenna for communications between an external programmer and an implantable medical device, said antenna comprising:

a self-resonating, monopole RF antenna included in the medical device, said monopole antenna having a free end and a connection end;

wherein the monopole RF antenna has an elongate form which is folded at least once and conformed inside the dielectric housing portion, and said connection end of the antenna is connected to an internal transmitter/receiver circuit having a ground reference, which ground reference, in turn, is connected to a metal housing portion which acts as a ground plane.

14. The antenna of claim 13, wherein the transmitter/receiver circuit is placed on an internal printed circuit board.

15. The antenna of claim 13, wherein the antenna elongate form is a conductive wire.

16. The antenna of claim 13, wherein the antenna is made from a conductive material from the group consisting of copper, platinum and gold.

17. The antenna of claim 16, wherein the antenna is formed from copper wire that is 20 AWG.

18. The antenna of claim 13, wherein the antenna elongate form is a conductive strip.

19. The antenna of claim 13, wherein the RF monopole antenna is folded within the dielectric housing portion to provide maximum separation between the folded monopole antenna and the metal housing portion.

20. The antenna of claim 19, wherein the folded monopole antenna is formed into a shape comprising a first arc and a second arc,

wherein the first arc is in a first plane and the second arc is in a second plane, which two planes are substantially parallel to each other.

21. The antenna of claim 13, wherein the RF monopole antenna is sized to provide an antenna self-resonance frequency of about 403.5 MHz.